

Yellow Saffron Tree (Adina cordifolia): A Promising multipurpose tree Species for Commercial Cultivation

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ABSTRACT

Adina cordifolia (*Haldina cordifolia*) commonly called as yellow saffron tree which belongs to the family Rubiaceae. The tree is native to Southern Asia and it has been used in folk medicine to cure chronic cough, jaundice, stomach aches, and a variety of other ailments by using the methanolic extracts of leaf, root and bark. It also known for its yellowish, moderately hard and durable timber. This document explores its cultivation, management, and economic potential of Haldu tree.

INTRODUCTION

Adina cordifolia (Roxb.) Hook. f. ex-Brandis, syn. *Haldina cordifolia* (Roxb.) commonly known as Haldu is large deciduous tree species of family Rubiaceae. The tree may attain 40 m height and straight clean bole of 18 m and a girth of 7 m and over, with a large high crown, erect trunk and horizontal branches (Anon, 1985).

The species is heavily exploited for fuel wood and fodder in its distribution ranges by the local people. Natural regeneration of this species is very difficult as the minute seeds (about 11 million seeds/kg) as well as young seedlings in forests are easily washed away the proportion of seedlings which survive and establish themselves in forests is relatively

very small. Further heavy browsing by wild animals causes tremendous damage to the young seedlings and saplings. Haldu is largely used for structural work. It is one of the best Indian Timbers suitable for flooring and for paneling and railway carriages.

General Information

The tree can grow over 20 meters tall; with heart-shaped leaves and yellow flowers that bloom in globose clusters. The bark of the tree is known for its antiseptic properties. It is commonly used in timber production due to its durable wood. The flowers, though small individually, form attractive inflorescences. It typically blossoms during winter (dry season) months.

Taxonomy and nomenclature

Haldina cordifolia (Roxb.) Ridsdale (Synonym: *Adina cordifolia* Benth. & Hook. f.) commonly known as Haldu belongs to the family Rubiaceae has a chromosome number of 22. The vernacular names are Manjakadambu (Malayalam), Lampatia, Tarak Chapa (Assamese), Keli- Kadam (Bengali), Heddi (Marathi), Haladwan, Holdarvo (Gujarati), Girikadamba (Sanskrit), Avanu, Kadambe (Kannada), Manjakadambai, Poontek (Tamil) and Bandaru, Pasupu Kadamba (Telugu). It is also known by the common name “Yellow Teak” due to the colour of the wood.

Distribution and environmental conditions

It is a South East Asian species. It is distributed throughout India, Burma, Sri Lanka, Bangladesh, Nepal, Thailand, South China, Bhutan, Vietnam, Myanmar and Malaysia. It is found scattered in deciduous forests throughout the greater part of India, (except in arid regions of Rajasthan) ascending to an altitude of 900 m in the sub-Himalayan tract. It is also common in the forests of South India. It grows well under 300-1000m altitude

and prefers well-drained soil. Suitable soil pH range is between 5.5 to 6.5. The annual temperature requirement is within the range of 25°C-35°C and prefers a mean annual rainfall between 1000-2000mm. It is not frost tolerant. The tree grows in various geological formations such as granite, gneiss, schist, quartzite, trap and laterite up to an elevation of 1000 MSL.

Natural Regeneration:

Natural regeneration of the species is sparse. The minute seeds shed during the hot season are often carried to a distance by the wind; in some cases, the fruit-heads fall before all the seeds are shed and the seed may germinate with the fruit-heads.

Vegetative Propagation:

Softwood cuttings are the most suitable when compared to hardwood and semi-hardwood cuttings. The cuttings treated with IBA (Indole-3 Butyric Acid) at a concentration of 2000 mg/l root well. Germination takes place within 20-40 days. Apical buds or shoot tips are the ideal explants for in vitro propagation.

Seed Collection:

Seeds are shed between April and June; Maturity indices of seeds could be identified through colour and moisture content of the fruit. The color will change from light green to light brown and moisture content of the fruit between 38-46% at maturity. The collected seed should be sun dried for 7 to 10 days and reduce the moisture content between 5-6% for attaining the maximum germination.

Nursery establishment

Haldina cordifolia does not require any pre-treatment for germination. Fresh and dried seeds may be used for germination. As the seeds are minute, instead of nursery beds, germination trays of the size 50cm × 50cm can

be used for sowing the seeds. Use either soil-vermiculite mixture (3 soil: 1 vermiculite) or wet polyurethane sheets as the medium to sow the seeds. About 18000 seeds which weigh around 10g can be sown in one tray. Almost 60 per cent of the sown seeds germinate in soil-vermiculite medium and on foam sheets; Raised nursery beds can also be used for germination, with the seed mixed with sand in 1: 3 ratios before sowing. Prick the seedlings in the tray and poly-pot in containers of 23cm × 17cm size, filled with potting mixture (3 soil: 1 sand). Potted seedlings can be kept in the shaded nursery for 2-3 months with watering once in a day and subsequently in the open for 15-30 days before planting. Data on optimum shade, watering and manure requirements in the nursery are not available. Growth in the first year is very slow, and the seedlings often reach only 2.5 cm in height during this time; in the second-year growth is faster, and the seedlings develop thick taproots.

Plantation establishment and growth

Field plant the poly-potted seedlings maintained in the nursery for 5-6 months. Remove the polythene cover without damaging the root system of the seedlings and planted in a suitable pit size of 30cm × 30cm × 30cm seedlings are to be planted in a such a way that the level of soil around the seedlings provide little terracing to avoid stagnation of water. About 70 per cent of the field-planted seedlings will survive during the first three months. Protection from drought is very essential for the survival of field planted seedlings. Seedlings will grow to a height of 16.7 cm within a period of eight months in the field.

Planting

- **Spacing:** Maintain 3–5 meters between trees for optimal growth and canopy development.

- **Time of Planting:** Plant at the onset of the rainy season to ensure adequate water for establishment.
- **Method:** Dig planting holes 30–40 cm deep, and fill with a mix of soil and organic compost before planting seedlings.

Fertilization

Application of NPK in the ratio of 10:10:10 or 20:10:10 which supports healthy growth. By adding zinc, boron and magnesium which further enhances leaf growth and flowering.

Pruning and Maintenance

- Regular pruning helps shape the tree and removes dead or diseased branches.
- Prune in the late winter or early spring when dormant.
- Trim off dead, diseased and crossing branches to promote good air circulation and light penetration which encourages vigorous growth and flowering.

Pest and Disease Management

Regarding the diseases, *Phytophthora* spp. causes crown rot when the trees are planted too deep in the soil. Powdery mildew is caused by *Podosphaera leucotricha* and fire blight also occurs in several areas which is controlled by application of Antibiotic sprays (Streptomycin or Terramycin) during the bloom period. Leaf spot and damping off disease occurs at the nursery level.

Utilization

Haldina is largely used for structural work. It is one of the best Indian timbers suitable for flooring, paneling and for railway carriages. It is also suitable for pulp and paper, construction, window frames, furniture, bobbins, piano keys and rulers. Wood is also used for pencil manufacturing. Other uses are

canoes and dugouts, planking of river boats, packing cases, cigar boxes, grain- measures, sieve frames, snuff boxes, furniture, yokes combs toys gunstocks, carving and turnery work, brush- backs and drums.

Medicinal uses

Its leaves, seeds, bark, and roots are used in traditional Indian medicine. Leaves and bark are used for cholera, cold cough, fever, headache, scars and skin blemishes and urinary complaints. Paste of stem bark and leaves are used for curing deep wounds, jaundice, stomachache and swelling in stomach (Jain et al., 2005). Stem bark is used for the treatment of malarial fever, abdominal disorders, inflammation, wound and ulcer (Narayan and Singh, 2017). It acts as a good antibacterial, antiseptic, anti-bilious, anti-diabetic and febrifuge agent (Rokade and Pawar, 2013).

CONCLUSION

The Haldu tree (*Adina cordifolia*) is a versatile, economically valuable and ecologically significant species. It provides high-quality timber, contributes to traditional

medicine and plays a vital role in agroforestry and forest conservation. With its moderate durability, aesthetic appeal and sustainable growth, the tree remains an important resource in various industries.

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